

11/20/00

11.21.00

A



JC89 U.S. PTO  
09/16/75



THE COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington D.C. 20231  
Box Patent Applications

Case Docket No. FUJZ 17.968  
Filed by Express Mail  
(Receipt No. EL522395564US)  
on November 20, 2000  
pursuant to 37 CFR 1.10  
by Lydia Gonzalez

S I R:

Transmitted herewith for filing is: ☒ a new application  
[ ] a c-i-p application of S.N. \_\_\_\_\_ filed \_\_\_\_\_

Inventor(s): Teruo TOBE; Hitoshi OHURA; Yoshiki SUZUKI; Kazuhiko YANAGIDATE;  
Hiroshi KOBAYASHI

For **NETWORK CONTROL APPARATUS**

Enclosed are:

- ☒ 6 sheets of drawings.(Figs. 1-8)
- ☒ Specification, including claims and abstract ( 13 pages)
- ☒ Declaration
- ☒ An assignment of the Invention to FUJITSU LIMITED
- ☒ A certified copy of Japanese Application No(s). 2000-024128
- ☒ An associate power of attorney
- [ ] A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27
- ☒ Post card
- ☒ Recording fee (as indicated below)
- ☒ Information Disclosure Statement, PTO-1449, copies of 3 references
- [ ] Other \_\_\_\_\_
- [ ] Other \_\_\_\_\_

	Col. 1	Col. 2
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	9-20 =	0
INDEP CLAIMS	1-3 =	1
[ ] MULTIPLE DEPENDENT CLAIMS PRESENTED		

\*If the difference in Col. 1 is less than zero, enter "0" in Col. 2

SMALL ENTITY	
RATE	FEE
	\$355
x 9 =	\$
x 40 =	\$
x 135 =	\$
TOTAL	\$355

OTHER THAN A SMALL ENTITY	
RATE	FEE
	\$710
x 18 =	\$
x 80 =	\$
x 270 =	\$
TOTAL	\$710

- [ ] Please charge our Deposit Account No. 08-1634 the amount of \_\_\_\_\_ to cover the filing fee and recording fee (if any)
- ☒ A check in the amount of \$750.00 to cover the filing fee and the recording fee (if any) is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of any fee associated with this communication or credit overpayment to Deposit Account No. 08-1634. A duplicate copy of this sheet is enclosed.

Helfgott & Karas, P.C.  
60<sup>th</sup> Floor  
Empire State Building  
New York, New York 10118-6098  
(212)643-5000

Respectfully Submitted,

Date: 11/20/00

Any fee due with this paper, not fully covered by an enclosed check, may be charged on Deposit Acct No. 08-1634

- [ ] Aaron B. Karas, Reg. No. 18,923
- ☒ Samson Helfgott, Reg. No. 23,072
- [ ] Leonard Cooper, Reg. No. 27, 625
- [ ] Linda S. Chan, Reg. No. 42,400
- [ ] Harris A. Wolin, Reg. No. 39,432
- [ ] Brian S. Myers, Reg. No. 46,947

## NETWORK CONTROL APPARATUS

### Background of the Invention

#### 5 Field of the Invention

The present invention relates to a network control apparatus, and in particular to a bandwidth control apparatus in a network such as an Internet service provider which provides an Internet access and an in-enterprise LAN.

10 In the network control apparatus, a traffic quantity within the network, or with respect to the Internet or the like as a backbone network connected to the outside changes with time as a utilizing status (availability) of user changes. Therefore, it is required to control the bandwidth of the network according to such a change of the traffic  
15 quantity.

#### Description of the Related Art

For a bandwidth control in a prior art LAN network control apparatus, as shown in Fig.7, such control methods have been adopted  
20 that a partition (area) is statically set over a whole bandwidth of a transmission line L to secure traffic channels independent of each other, thereby improving a quality of service (QoS), and that a priority for using a bandwidth per user is statically set.

The prior art LAN network control apparatus using the above-  
25 mentioned bandwidth control methods performs the bandwidth control by static setting. Therefore, when a file is transferred at one time by a method such as an FTP (File Transfer Protocol), or a plurality of connections are started up, the apparatus can not flexibly deal with a utilizing status of the inside of the LAN network or a backbone  
30 changing with time. Accordingly, there has been a problem that a stable quality of service can not be always maintained.

## Summary of the Invention

It is accordingly an object of the present invention to provide a network control apparatus which can dynamically control a bandwidth flexibly corresponding to a traffic status of a user.

Fig.1 shows a schematic arrangement of a network control apparatus according to the present invention. A portion 10 shown by a dotted line indicates an LAN network control apparatus exemplified for a network control apparatus according to the present invention, which is connected to an LAN network 20 connecting terminal equipments 200 such as personal computers and to the Internet 30 as a backbone, e.g. through a router 40.

The LAN network control apparatus 10 comprises a detector 1 for detecting a packet passing through a network and a fact that a whole traffic quantity exceeds a predetermined threshold value, a database DB for holding packet information per user detected by the detector 1, a bandwidth managing portion 2 for detecting a bandwidth occupant based on the information per user in the database DB and for selecting a corresponding bandwidth control method when the detector 1 has detected that the whole traffic quantity has exceeded the predetermined threshold value, and a bandwidth controller 3 for performing a bandwidth control to the bandwidth occupant based on the bandwidth control method selected by the bandwidth managing portion 2.

The arrangement of the present invention shown in Fig.1 will now be described referring to a schematic diagram of an operation diagram shown in Fig.2.

In the present invention, the detector 1 firstly detects a packet passing through the network such as a route leading to the LAN network 20 from the Internet 30, and monitors the whole traffic quantity of the network to write the information per user (per-user-

information) in the database DB (at step S1).

The detector 1 further determines whether or not the traffic quantity of the whole network exceeds a predetermined threshold value (at step S2).

5       As a result, when it is found that the whole traffic quantity exceeds the predetermined threshold value, the bandwidth managing portion 2 which has received this notification detects which user occupies the bandwidth referring to a utilizing status table T1 per user (per-user-utilizing status table) and a user order table T2 written in  
10   the database DB (at step S3), selects the bandwidth control method corresponding to the user based on a bandwidth control method selection table T3 preliminarily provided in the database DB (at step S4), and notifies the bandwidth controller 3 of the selected method. It is to be noted that "bandwidth occupation" includes the status of  
15   utilizing a part of the bandwidth of the transmission line.

Receiving the notification from the bandwidth managing portion 2, the bandwidth controller 3 performs the bandwidth control (set/release) (at step S5).

20       The above-mentioned detector 1 may have a variable value as the predetermined threshold value.

25       The above-mentioned per-user-utilizing status table T1 may include at least one of an average traffic quantity, an average communication data quantity, an average packet number, an average connection number, and an average session time as a parameter of the per-user-information.

Also, the user order table T2 indicates a ranking (order) of users in respect of each parameter of the per-user-information. The bandwidth managing portion 2 may detect a highest ranking bandwidth occupant at one specified parameter based on the user  
30   ranking table T2 (at step S2), determine whether or not the value of another parameter exceeds a corresponding predetermined threshold

value by referring to the per-user-utilizing status table T1 when the value of the specified parameter at this time exceeds a corresponding predetermined threshold value, gives points indicating a bandwidth occupation degree when the threshold value is exceeded, and select a  
5 bandwidth control method based on the current point from the bandwidth control method selection table T3 (at step S4).

The selection table T3 indicates a correspondence between the point and the bandwidth control method. The bandwidth control method may have contents of the transmission of packet to a partition  
10 for a bandwidth occupant and a priority at the time the packet is passed through the partition.

Furthermore, the bandwidth managing portion 2 may use the total value of the above-mentioned points of the parameters.

Moreover, the database DB may have a total point table T4 per  
15 user (per-user-total point table) indicating a correspondence between each user and the total point. When the whole traffic quantity is less than the predetermined threshold value after performing the bandwidth control (at step S5), the bandwidth controller 3 may sequentially release the bandwidth control in order from a user with a  
20 smaller point, based on the per-user-total point table T4 (at step S5), whereby the bandwidth managing portion 2 may clear the point of the user where bandwidth control is released, from the per-user-total point table T4.

Thus, in this invention, the bandwidth control can be performed  
25 according to the whole traffic quantity and the bandwidth availability of the user with a higher traffic quantity, so that it becomes possible to perform a flexible control corresponding to the bandwidth availability changing with time.

#### 30 Brief Description of the Drawings

Fig.1 is a schematic diagram showing an arrangement of an LAN

network control apparatus exemplified for a network control apparatus according to the present invention;

Fig.2 is a schematic diagram showing an operation of an LAN network control apparatus according to the present invention;

5 Fig.3 is a flow chart showing an operation embodiment of an LAN network control apparatus according to the present invention;

Fig.4 is a diagram showing an embodiment of a per-user-utilizing status table T1 used in an LAN network control apparatus according to the present invention;

10 Fig.5 is a diagram showing an embodiment of a user order table T2 used in an LAN network control apparatus according to the present invention;

Fig.6 is a diagram showing an embodiment of a bandwidth control method selection table T3 used in an LAN network control apparatus according to the present invention;

15 Fig.7 is a diagram illustrating a partition for a bandwidth occupant used in an LAN network control apparatus according to the present invention; and

Fig.8 is a diagram showing an embodiment of a per-user-total point table T4 used in an LAN network control apparatus according to the present invention.

Throughout the figures, like reference numerals indicate like or corresponding components.

## 25 Description of the Embodiments

Fig.3 shows an embodiment of an operation of an LAN network control apparatus according to the present invention shown in Figs.1 and 2. In addition, the embodiments of the tables T1-T4 in the database DB shown in Fig.2 are respectively shown in Figs.4-6 and Fig.8. Referring to these tables, the operation example of Fig.3 will now be described.

It is to be noted that the detector 1 is composed of steps S11 and S12, the bandwidth managing portion 2 is composed of steps S13-S31, and the bandwidth controller 3 is composed of steps S32 and S33, as seen in Fig.3.

5       The detector 1 firstly monitors a packet passing through the network corresponding to step S1 of Fig.2, and writes the per-user-information as to the packet in the database DB (at step S11).

10       Being described referring to Fig.4, the table T1 in this embodiment is composed of an average traffic quantity (bps), an average communication data quantity (byte), an average packet number, an average connection number, and an average session time (h) as the packet information per user. For this packet information, as shown in Fig.4, the average value on each day of a week (Monday to Sunday) is calculated.

15       The table T1 shown in Fig.4 is to be stored in the database DB corresponding to every user. Based on the table T1, the user ranking (order) table T2 shown in Fig.5 as another per-user-utilizing status table indicates the ranking of the users in respect of the parameter of each packet information.

20       Namely, when the average traffic quantities shown in Fig.4 are totaled per user to determine the ranking, it is found from the example of Fig.5 that a user with an IP address "a.a.a.a" is the highest ranking bandwidth occupant, and a user with an IP address "z.z.z.z" is the "n"th bandwidth occupant. Similarly, the orders of the users in respect  
25 of the average communication data quantity, the average packet number, the average connection number, and the average session time are determined in the table T2.

30       Thus, when the write in the database DB is performed, the detector 1 determines whether or not the traffic quantity of the whole packets passing through the network exceeds the threshold value for the above-mentioned step S2 (at step S12).

The whole traffic quantity in this embodiment is the total value of the average traffic quantities of the whole users in the table T1 shown in Fig.4.

As a result, when it is found that the whole traffic quantity exceeds the threshold value, the process proceeds to step S13 in the bandwidth managing portion 2 to detect the highest ranking user as the bandwidth occupant (at step S13). This detection is made by referring to the ranking of the users in respect of the average traffic quantity shown in table T2 of Fig.5, the highest ranking user (the user with the IP address "a.a.a.a" in this example).

Since the highest ranking bandwidth occupant has been detected, the bandwidth managing portion 2 refers to the table T1 on this user (at step S14), and determines whether or not any of the average traffic quantities exceeds the threshold value (at step S15). For example, assuming that the average traffic quantity for one week is a threshold value, whether or not the average traffic quantity "54389 (bps)" on Monday exceeds this threshold value is determined.

As a result, if it is found that the average traffic quantity exceeds the threshold value, the process proceeds to steps S16-S19.

At step S16, referring to the average communication data quantity in the table T1 for another packet information parameter, whether or not the average communication data quantity exceeds the threshold value is determined e.g. with the average value for one week being made the threshold value as above-noted (at step S20).

When it is found that the average communication data quantity at this time exceeds the threshold value, weighting indicating a bandwidth occupation degree is performed (at step S24). At this step, a predetermined point such as "1" is added thereto. When it is found that the average communication data quantity does not exceed the threshold value, such an addition is not performed.

Similarly, as shown in steps S17, S21, and S25, the average



packet number is compared with a predetermined threshold value such as average value for one week. Only when it exceeds the threshold value, the weighting (point addition) is performed.

Moreover, as shown in steps S18, S22, and S26, the average connection number is compared with a threshold value (e.g. average value of a week), and only when it exceeds the threshold value, the weighting (point addition) is performed.

Furthermore, as shown in steps S19, S23, and S27, the average session time is compared with a threshold value such as average value for one week. Only when it exceeds the threshold value, the weighting (point addition) is performed.

It is to be noted that only when the average traffic quantity exceeds the threshold value at step S14 in the above-mentioned embodiment, the weighting of the parameters shown at steps S16-S19 is performed, however, that these five parameters can be replaced with each other.

For example at step S14 it is also possible that the average packet number is referred to, and only when the average packet number exceeds the threshold value, the weighting for other parameters, i.e. average traffic quantity, average communication data quantity, average connection number, and average session time is performed.

After performing the weighting for the parameter of the packet information (adding point) in this way, these points are totaled (at step S28). Then, according to the total point, the bandwidth control method is selected (at step S29).

In the bandwidth control method selection table T3 shown in Fig.6, the total point, the contents of the bandwidth control method, and the command are preset.

The contents of the bandwidth control method shown in this table T3 will now be described referring to the example of Fig.7.

Assuming that the total point is "3" for example, the packet of the concerned bandwidth occupant is transmitted to a partition ① for the bandwidth occupant corresponding to 10% of the whole bandwidth of the transmission line L, a priority value is set with "2" at the time the packet is passed through the partition ①, and the commands for setting a control method ① and for setting a control method ⑤ are respectively transmitted to the bandwidth controller 3.

It is to be noted that the higher the priority value the higher the priority ranking. Accordingly, when the total point is "0" for example, the priority value is set with "5", and the packet transmission to the partition ① for the bandwidth occupant is executed without fail because of the highest priority. However, the lower the priority ranking is, the later the transmission to the partition ① will be executed.

Thus, the bandwidth managing portion 2 selects the bandwidth control method corresponding to the total point, and the bandwidth controller 3 to which the command is given performs the bandwidth control and notifies the bandwidth managing portion 2 of the release of the bandwidth control. Receiving the release notification of the bandwidth control, the bandwidth managing portion 2 clears the total point of the corresponding user (at step S31).

Namely, when the bandwidth control is performed (at step S32), a part of the bandwidth is to be confined in the partition ①. Therefore, the traffic quantity of the packet by the general user shown in Fig.7 is decreased. This bandwidth control is continued until the whole traffic quantity at step S12 becomes less than the threshold value.

When the whole traffic quantity of the packets passing through the network becomes less than the threshold value at step S12, it is determined whether or not the user exists (at step S30) to whom a bandwidth control is performed in this status. When such a user exists, as shown in the per-user-total point table T4 in Fig.8, in the bandwidth control immediately before, the bandwidth control to the concerned

user is released (at step S33).

However, in case that the bandwidth control is performed to a plurality of users as shown in Fig.8, the bandwidth control is sequentially released in order from the user with a smaller point, whereby the deletion of the total point is executed (at step S31). This is for restraining a control gain and for avoiding a sudden increase and decrease of the bandwidth.

It is to be noted that the table T4 shown in Fig.8 is prepared corresponding to the IP address for the total point per user at the time the bandwidth managing portion 2 has totaled the points (at step S28).

As described above, a network control apparatus according to the present invention is arranged such that when a whole traffic quantity of a packet passing through the network exceeds a threshold value, per-user-information is analyzed based on a database holding packet information, and a bandwidth control method in conformity with the analysis result is selected to perform/release the bandwidth control. Therefore, it becomes possible to dynamically and flexibly control a backbone traffic according to a utilizing status per user changing with time, to control an unbalanced traffic by some bandwidth occupants, to effectively make use of the backbone, and in turn to suppress the cost of the backbone as increased in speed.

What we claim is:

1. A network control apparatus comprising:

a detector for detecting a packet passing through a network and a fact that a whole traffic quantity exceeds a predetermined threshold value,

a database for holding packet per-user-information detected by the detector,

a bandwidth managing portion for detecting a bandwidth occupant based on the per-user-information in the database and for selecting a corresponding bandwidth control method when the detector has detected that the whole traffic quantity has exceeded the predetermined threshold value, and

a bandwidth controller for performing a bandwidth control to the bandwidth occupant based on the bandwidth control method selected by the bandwidth managing portion.

2. The network control apparatus as claimed in claim 1 wherein the detector has a variable value as the predetermined threshold value.

3. The network control apparatus as claimed in claim 1 wherein the database has a utilizing status table per user including at least one of an average traffic quantity, an average communication data quantity, an average packet number, an average connection number, and an average session time as a parameter of the per-user- information.

4. The network control apparatus as claimed in claim 3 wherein the database includes a user ranking table indicating a ranking of users in respect of each parameter in addition to the utilizing status table.

5. The network control apparatus as claimed in claim 4 wherein the bandwidth managing portion detects a highest ranking bandwidth occupant at one specified parameter based on the user ranking table, determines whether or not a value of another parameter exceeds a corresponding predetermined threshold value by referring to the utilizing status table per user when the value of the specified

parameter at this time exceeds a corresponding predetermined threshold value, gives points indicating a bandwidth occupation degree when the threshold value is exceeded, and selects the bandwidth control method based on the point at this time.

5 6. The network control apparatus as claimed in claim 5 wherein the database has a bandwidth control method selection table indicating a correspondence between the point and the bandwidth control method, and the bandwidth control method has contents of a transmission of packet to a partition for a bandwidth occupant and a priority ranking  
10 at a time the packet is passed through the partition.

7. The network control apparatus as claimed in claim 5 wherein the bandwidth managing portion totals points of the parameters in the utilizing status table per user.

8. The network control apparatus as claimed in claim 7 wherein the  
15 database has a total point table per user indicating a correspondence between each user and the total point.

9. The network control apparatus as claimed in claim 8 wherein when the whole traffic quantity is less than the predetermined threshold value after performing the bandwidth control, the bandwidth  
20 controller sequentially releases the bandwidth control in order from a user with a smaller point based on the total point table per user, whereby the bandwidth managing portion clears the point of the user of which bandwidth control is released.

## ABSTRACT

In a network control apparatus which can dynamically control a bandwidth corresponding to a traffic status of a user flexibly, when a whole traffic quantity of a packet passing through the network exceeds a threshold value, per-user-information is analyzed based on a database holding packet information, and a bandwidth control method in conformity with the result of the analysis is selected to perform/release the bandwidth control.

FIG.1

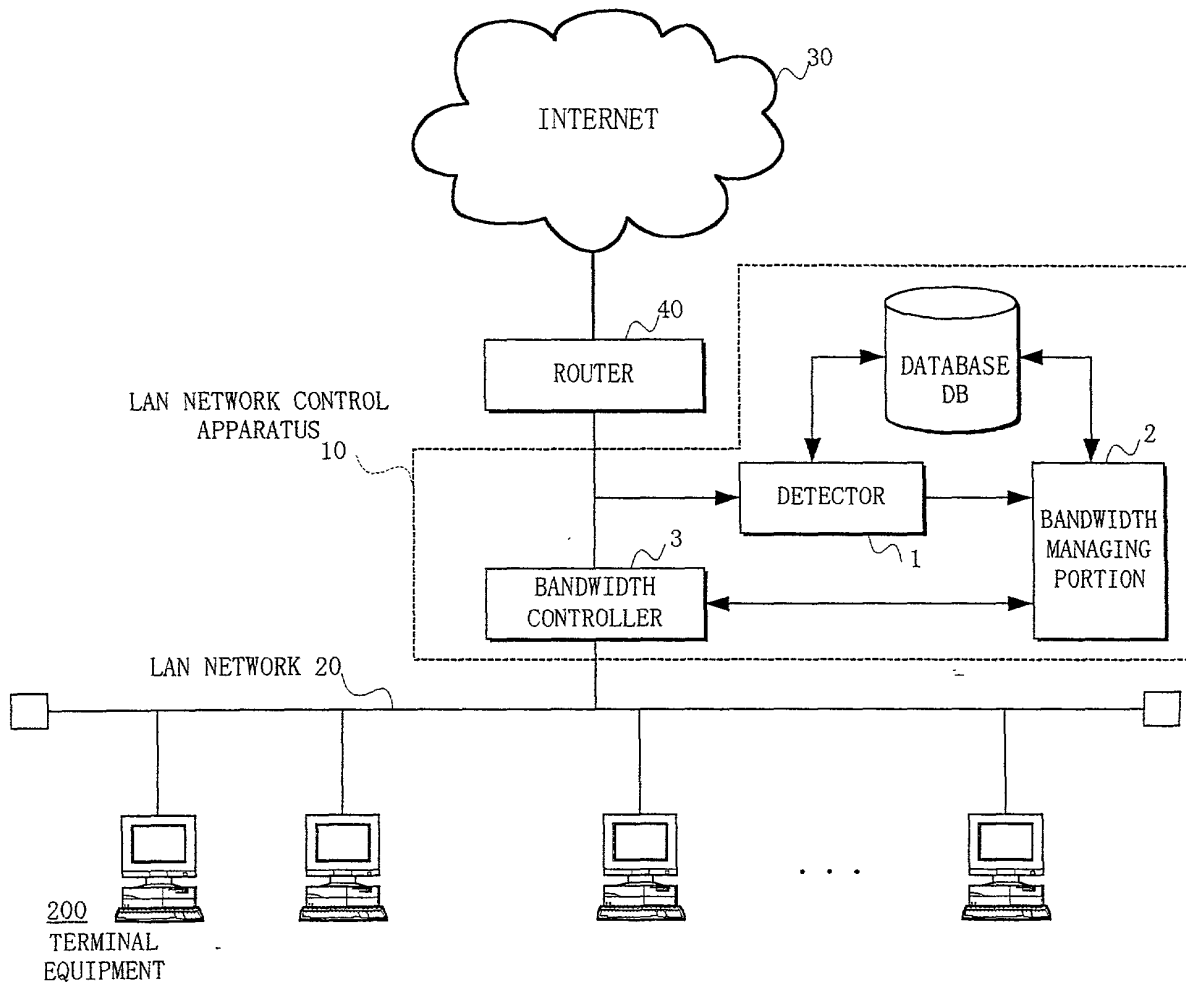


FIG.2

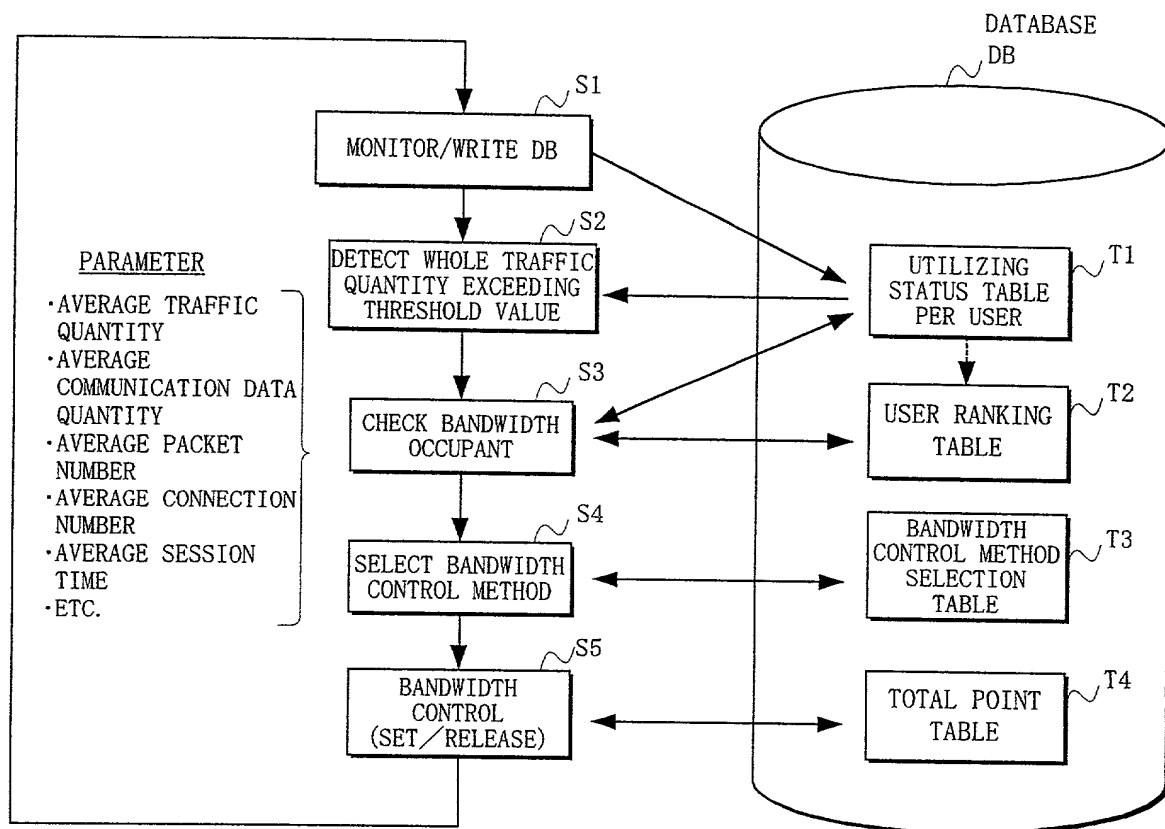




FIG. 3

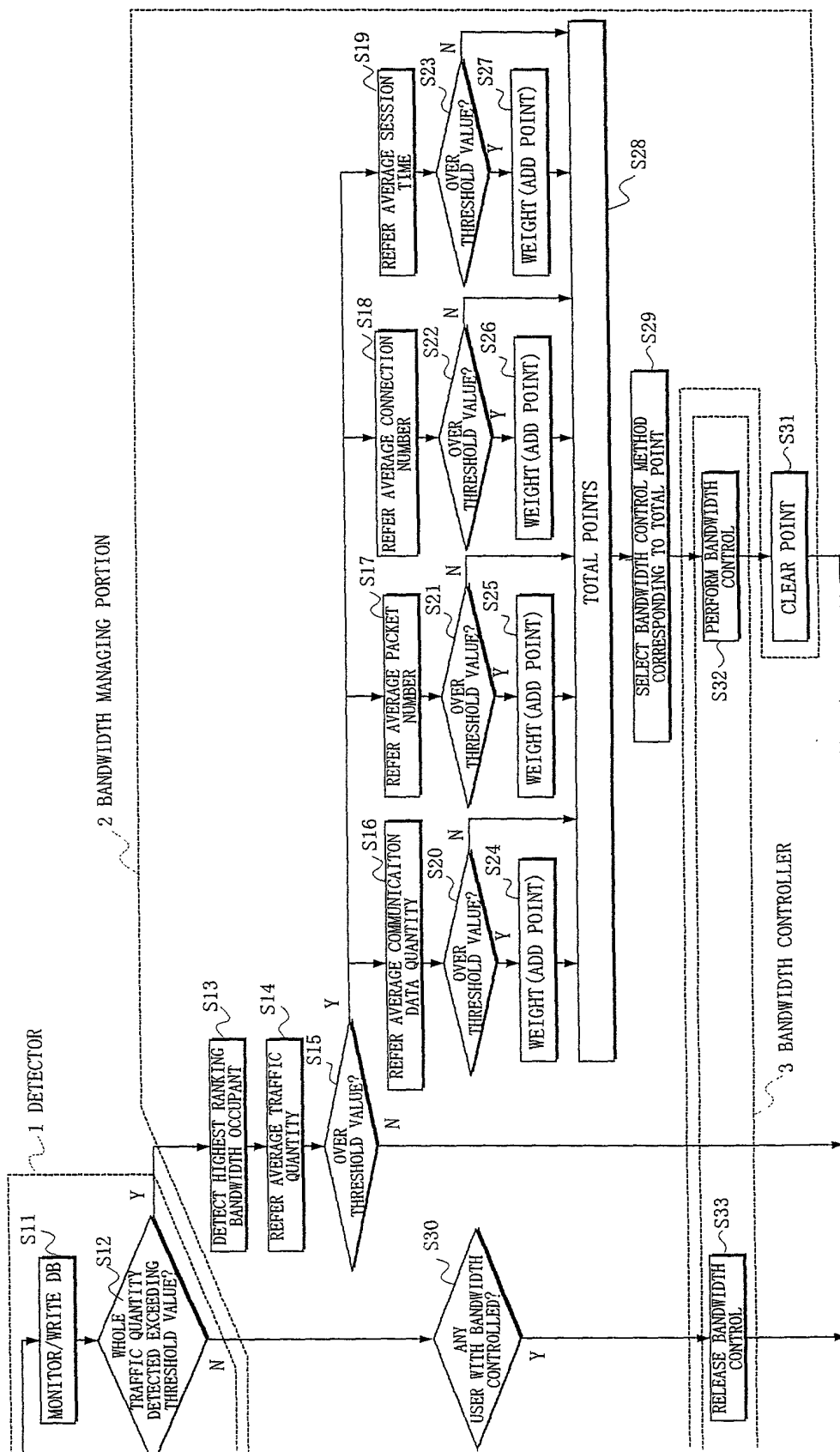


FIG.4

T1

	AVERAGE TRAFFIC QUANTITY (bps)	AVERAGE COMMUNICATION DATA QUANTITY (byte)	AVERAGE PACKET NUMBER	AVERAGE CONNECTION NUMBER	AVERAGE SESSION TIME (h)
MON.	54389	34579	41239847	4	1.2
TUE.	4569	5378495	52398187	12	0.8
WED.	2384092	234798	13824978	23	4.3
THU.	34789	53478	1248330	34	2.9
FRI.	4387	435893	384032980	44	3
SAT.	2340	237489	1384597	83	2.1
SUN.	23080556	42398	38423570148	2	5

FIG.5

T2

RANKING	USER WITH HIGHER TRAFFIC (IP ADDRESS)				
	AVERAGE TRAFFIC QUANTITY (bps)	AVERAGE COMMUNICATION DATA QUANTITY (byte)	AVERAGE PACKET NUMBER	AVERAGE CONNECTION NUMBER	AVERAGE SESSION TIME (h)
1	a. a. a. a	a. a. a. a	a. a. a. a	b. b. b. b	a. a. a. a
2	b. b. b. b	c. c. c. c	b. b. b. b	a. a. a. a	b. b. b. b
3	c. c. c. c	b. b. b. b	d. d. d. d	d. d. d. d	c. c. c. c
4	d. d. d. d	d. d. d. d	c. c. c. c	c. c. c. c	d. d. d. d
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
n	z. z. z. z	z. z. z. z	z. z. z. z	z. z. z. z	z. z. z. z

FIG.6

T3

TOTAL POINT	BANDWIDTH CONTROL METHOD	COMMAND
4	<ul style="list-style-type: none"> <li>•TRANSMITTING PACKET TO PARTITION ① FOR BANDWIDTH OCCUPANT (10% ENCLOSURE OF WHOLE BANDWIDTH)</li> <li>•PASSING PACKET THROUGH PARTITION ⑥ FOR BANDWIDTH OCCUPANT; SET PRIORITY VALUE WITH "1"</li> </ul>	<ul style="list-style-type: none"> <li>•COMMAND FOR SETTING CONTROL ①</li> <li>•COMMAND FOR SETTING CONTROL ⑥</li> </ul>
3	<ul style="list-style-type: none"> <li>•TRANSMITTING PACKET TO PARTITION ① FOR BANDWIDTH OCCUPANT (10% ENCLOSURE OF WHOLE BANDWIDTH)</li> <li>•PASSING PACKET THROUGH PARTITION ⑤ FOR BANDWIDTH OCCUPANT; SET PRIORITY VALUE WITH "2"</li> </ul>	<ul style="list-style-type: none"> <li>•COMMAND FOR SETTING CONTROL ①</li> <li>•COMMAND FOR SETTING CONTROL ⑤</li> </ul>
2	<ul style="list-style-type: none"> <li>•TRANSMITTING PACKET TO PARTITION ① FOR BANDWIDTH OCCUPANT (10% ENCLOSURE OF WHOLE BANDWIDTH)</li> <li>•PASSING PACKET THROUGH PARTITION ④ FOR BANDWIDTH OCCUPANT; SET PRIORITY VALUE WITH "3"</li> </ul>	<ul style="list-style-type: none"> <li>•COMMAND FOR SETTING CONTROL ①</li> <li>•COMMAND FOR SETTING CONTROL ④</li> </ul>
1	<ul style="list-style-type: none"> <li>•TRANSMITTING PACKET TO PARTITION ① FOR BANDWIDTH OCCUPANT (10% ENCLOSURE OF WHOLE BANDWIDTH)</li> <li>•PASSING PACKET THROUGH PARTITION ③ FOR BANDWIDTH OCCUPANT; SET PRIORITY VALUE WITH "4"</li> </ul>	<ul style="list-style-type: none"> <li>•COMMAND FOR SETTING CONTROL ①</li> <li>•COMMAND FOR SETTING CONTROL ③</li> </ul>
0	<ul style="list-style-type: none"> <li>•TRANSMITTING PACKET TO PARTITION ① FOR BANDWIDTH OCCUPANT (10% ENCLOSURE OF WHOLE BANDWIDTH)</li> <li>•PASSING PACKET THROUGH PARTITION ② FOR BANDWIDTH OCCUPANT; SET PRIORITY VALUE WITH "5"</li> </ul>	<ul style="list-style-type: none"> <li>•COMMAND FOR SETTING CONTROL ①</li> <li>•COMMAND FOR SETTING CONTROL ②</li> </ul>

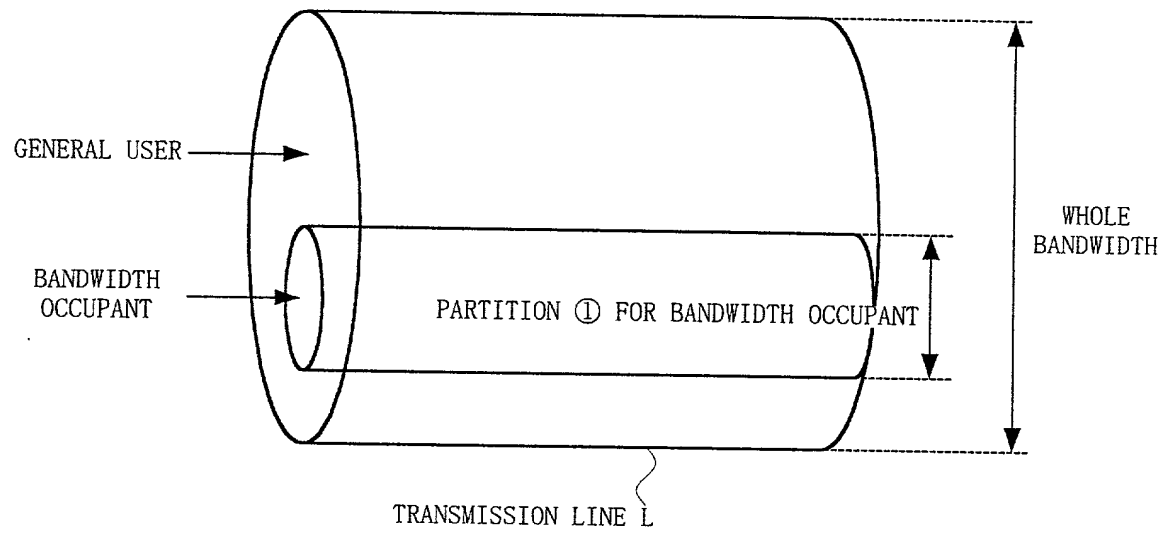
※ HIGHER PRIORITY VALUE INDICATES HIGHER PRIORITY

FIG.8

T4

IP ADDRESS	TOTAL POINT
a. a. a. a	4
b. b. b. b	0
c. c. c. c	1
d. d. d. d	3
.	.
.	.
.	.
z. z. z. z	2

FIG.7



**Declaration and Power of Attorney For Patent Application****特許出願宣言書及び委任状****Japanese Language Declaration****日本語宣言書**

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

NETWORK CONTROL APPARATUS

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ 月 日 に提出され、米国出願番号または特許協定条約国際出願番号を \_\_\_\_\_ とし、  
（該当する場合） \_\_\_\_\_ に訂正されました。

☐ was filed on \_\_\_\_\_  
as United States Application Number or  
PCT International Application Number  
\_\_\_\_\_ and was amended on  
\_\_\_\_\_ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

## Japanese Language Declaration (日本語宣言書)

私は、米国法典第35編119条(a)-(d)項又は365条(b)項に基づき下記の、米国以外の国の少なくとも一カ国を指定している特許協力条約365(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

### Prior Foreign Application(s)

外国での先行出願  
2000-024128

Japan

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed

優先権主張なし

(Number)  
(番号)

(Country)  
(国名)

1st/February/2000

(Day/Month/Year Filed)  
(出願年月日)

☐

(Number)  
(番号)

(Country)  
(国名)

(Day/Month/Year Filed)  
(出願年月日)

☐

私は、第35編米国法典119条(e)項に基づいて下記の米国外特許出願規定に記載された権利をここに主張いたします。

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

私は、下記の米国法典第35編120条に基づいて下記の米国外特許出願に記載された権利、又は米国を指定している特許協力条約365条(c)に基づき権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国外特許出願に開示されていない限り、その先行米国外出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

(Status: Patented, Pending, Abandoned)  
(現況: 特許許可済、係属中、放棄済)

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

(Status: Patented, Pending, Abandoned)  
(現況: 特許許可済、係属中、放棄済)

私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じていることに基づき表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行えば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**Japanese Language Declaration**  
(日本語宣言書)

委任状: 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。(弁護士、または代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)

書類送付先

Aaron B. KARAS, Reg. No. 18,923; Samson HELFGOTT,  
Reg. No. 23,072 and Leonard COOPER Reg. No. 27,625  
Send Correspondence to:  
HELFGOTT & KARAS, P.C.  
Empire State Building, 60th Floor  
New York, New York 10118  
United States of America

直接電話連絡先: (名前及び電話番号)

Direct Telephone Calls to: (name and telephone number)

Helfgott & Karas, P.C.  
(212) 643-5000

唯一または第一発明者名	Full name of sole or first inventor
発明者の署名	Inventor's signature
日付	Date
住所	Residence
国籍	Citizenship
私書箱	Post Office Address
c/o FUJITSU LIMITED, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, Japan	
第二共同発明者	Full name of second joint inventor, if any
第二共同発明者	Second inventor's signature
日付	Date
住所	Residence
国籍	Citizenship
私書箱	Post Office Address
c/o FUJITSU LIMITED, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, Japan	

(第三以降の共同発明者についても同様に記載し、署名をすること)

(Supply similar information and signature for third and subsequent joint inventors.)

第三共同発明者	Full name of third joint inventor, if any Yoshiki Suzuki		
第三共同発明者	日付	Third inventor's signature <i>Yoshiki Suzuki</i>	Date October 25, 2000
住 所	Residence Kawasaki, Japan		
国 籍	Citizenship Japan		
私書箱	Post Office Address c/o FUJITSU LIMITED, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, Japan		

第四共同発明者	Full name of fourth joint inventor, if any Kazuhiko Yanagidate		
第四共同発明者	日付	Fourth inventor's signature <i>Kazuhiko Yanagidate</i>	Date October 25, 2000
住 所	Residence Kawasaki, Japan		
国 籍	Citizenship Japan		
私書箱	Post Office Address c/o FUJITSU LIMITED, 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki-shi, Kanagawa 211-8588, Japan		

第五共同発明者	Full name of fifth joint inventor, if any Hiroshi Kobayashi		
第五共同発明者	日付	Fifth inventor's signature <i>Hiroshi Kobayashi</i>	Date October 25, 2000
住 所	Residence Yokohama, Japan		
国 籍	Citizenship Japan		
私書箱	Post Office Address 203 Bell View Hiyoshi, 15-29, Minowa-cho 2-chome, Kohoku-ku, Yokohama-shi, Kanagawa 223-0051, Japan		

第六共同発明者	Full name of sixth joint inventor, if any		
第六共同発明者	日付	Sixth inventor's signature	Date
住 所	Residence		
国 籍	Citizenship		
私書箱	Post Office Address		

(第七以降の共同発明者についても同様に記載し、署名をすること)

(Supply similar information and signature for seventh and subsequent joint inventors.)



**THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Teruo TOBE et al.**

Filed : **Concurrently herewith**  
For : **NETWORK CONTROL APPARATUS**  
Serial No. : **Concurrently herewith**

November 20, 2000

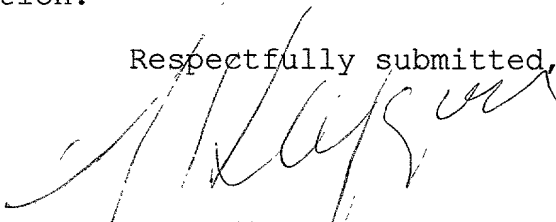
Assistant Commissioner of Patents  
Washington, D.C. 20231

**SUB-POWER OF ATTORNEY**

S I R:

I, Samson Helfgott, Reg. No. 18,923 attorney of record herein, do hereby grant a sub-power of attorney to Linda S. Chan, Reg. No. 42,400, Harris A. Wolin, Reg. No. 39,432 and Brian S. Myers, Reg. No. 46,947 to act and sign in my behalf in the above-referenced application.

Respectfully submitted,

  
\_\_\_\_\_  
Samson Helfgott  
Reg.No 23,072

HELFGOTT & KARAS, P.C.  
60th FLOOR  
EMPIRE STATE BUILDING  
NEW YORK, NY 10118  
DOCKET NO.:FUJZ17.968  
LHH:power

Filed Via Express Mail  
Rec. No.:EL522395564US  
On: November 20, 2000  
By: Lydia Gonzalez  
Any fee due as a result of this paper,  
not covered by an enclosed check may  
be charged on Deposit Acct. No. 08-  
1634.